Diarrhetic shellfish poisoning in Sequim Bay

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Background

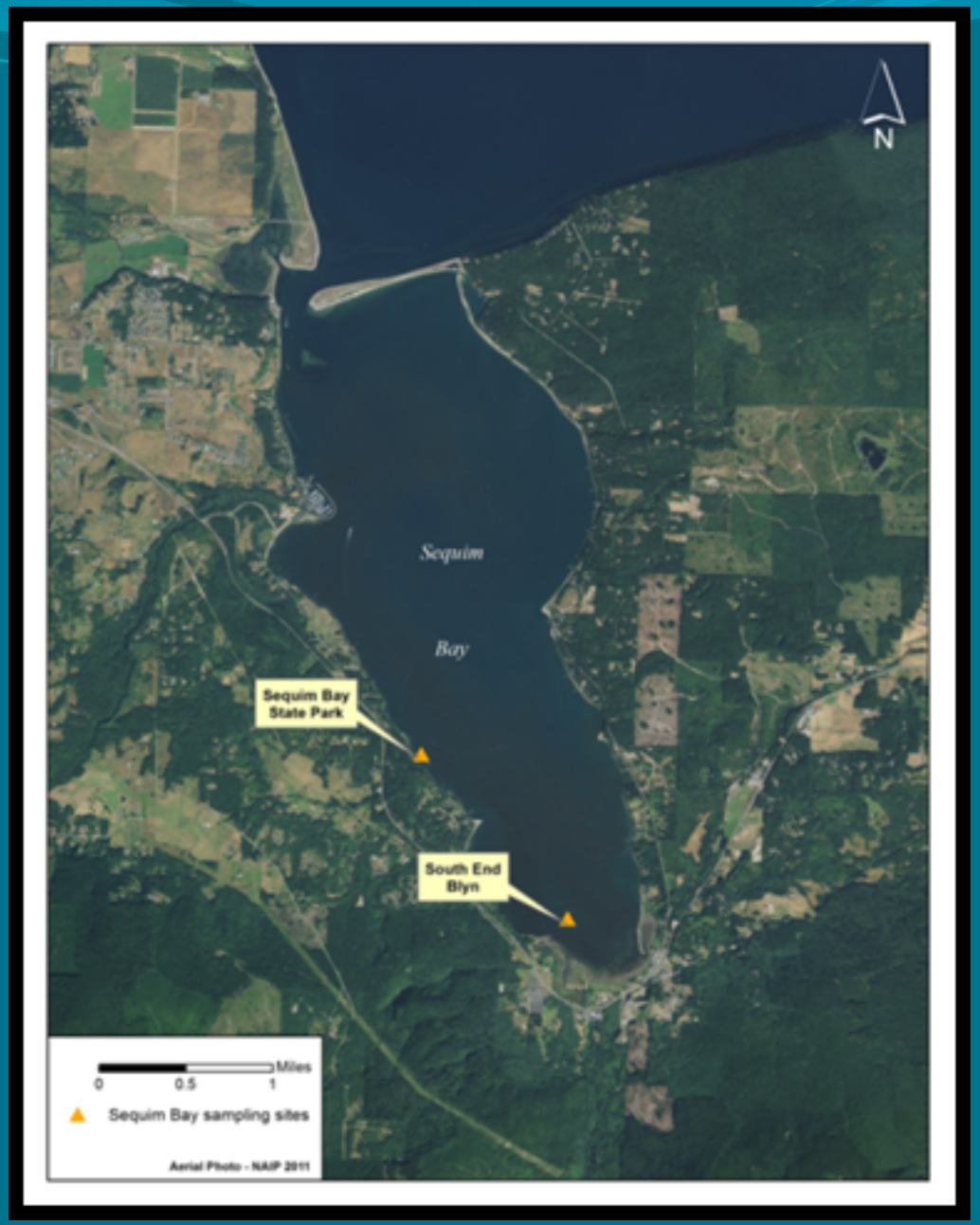
- Shellfish are an important subsistence, ceremonial and economic resource for the Tribe
- Treaty protected resource
- 1st cases of DSP in US occurred two miles from the Tribe's shellfish beds in 2011.
- 1st PSP in Puget Sound 1957 in Butter clams

2011: What did we need to know (fast)

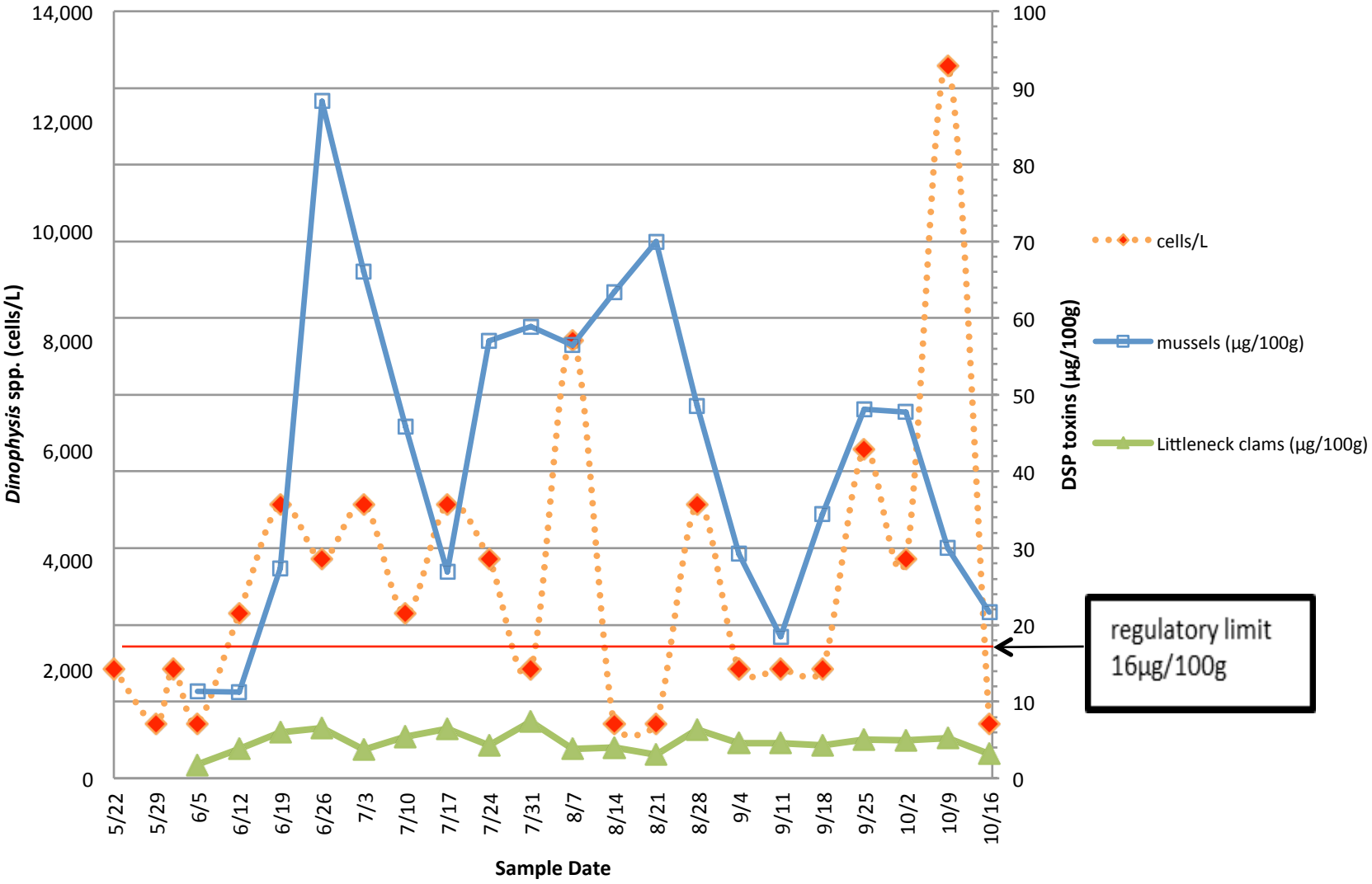
- Can *Dinophysis* abundance give a warning of toxic events? Are some species more toxic than others?
  - Work with NOAA and Soundtoxin partnership
- How do we know if shellfish are toxic? If so are different species more affected?
  - We evaluated Jellett rapid test strips
  - NOAA and WDOH LC-MS

Sequim Bay Sampling

- State Park site of Soundtoxins monitoring
- Blyn site of Tribe's clams, oysters
- Phytoplankton, shellfish, physical parameters, particulate toxin filters

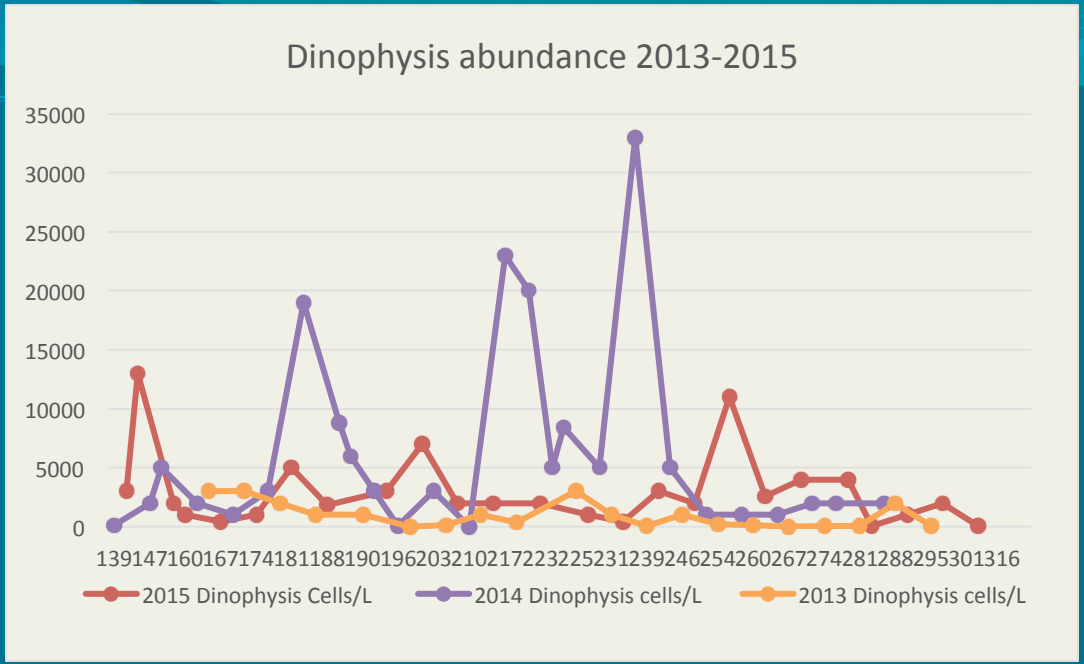


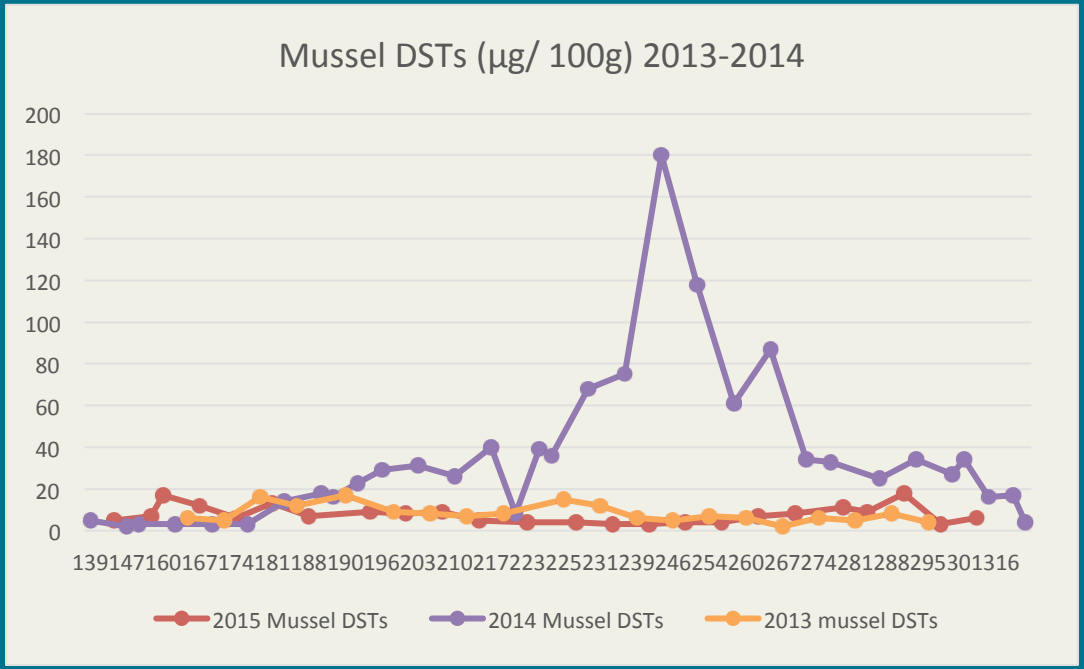
Sequim Bay State Park 2012
Dinophysis vs shellfish toxicity



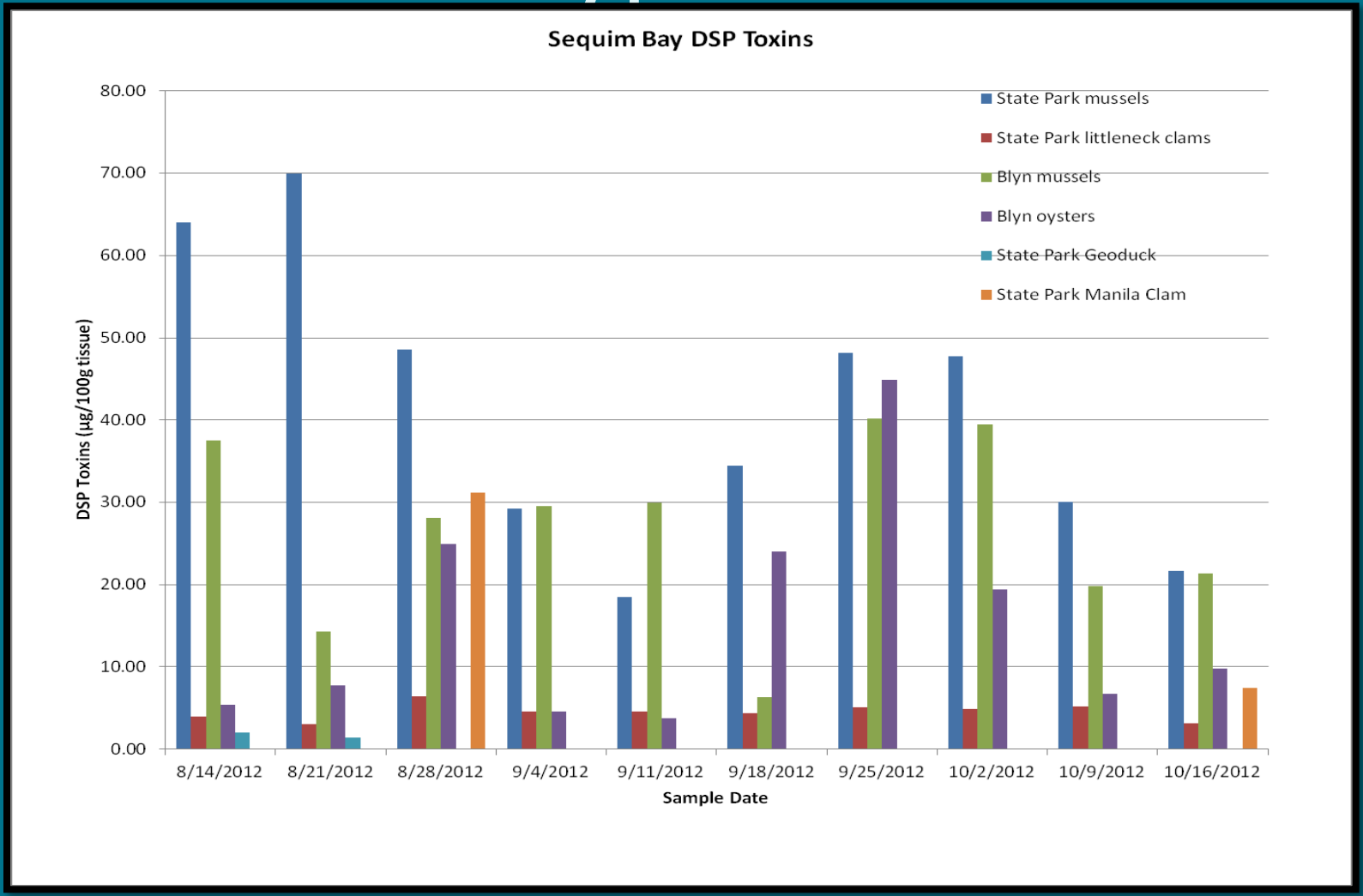
Sequim Bay *Dinophysis* and DSTs

Shellfish harvest closures due to DSP every year since 2011



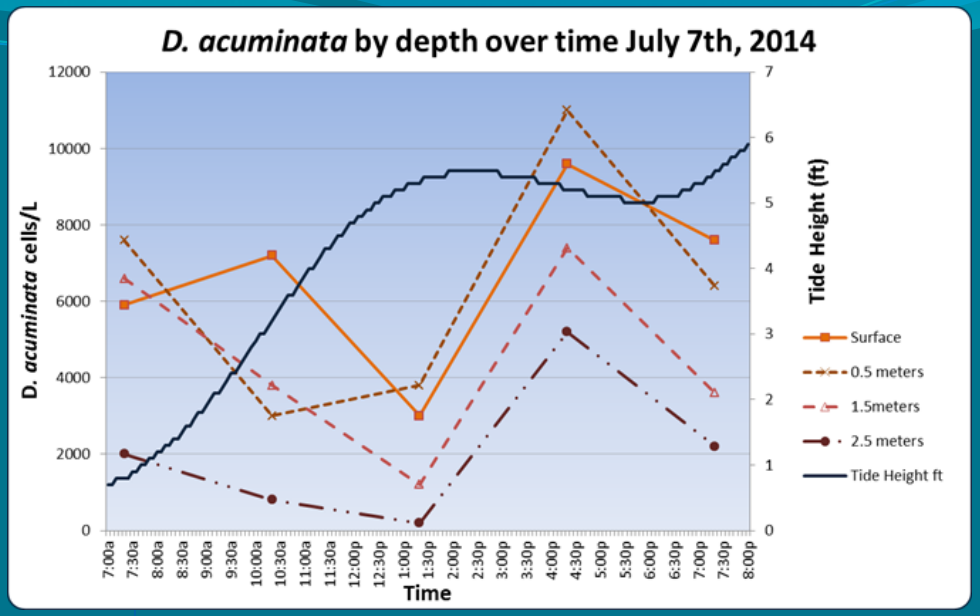


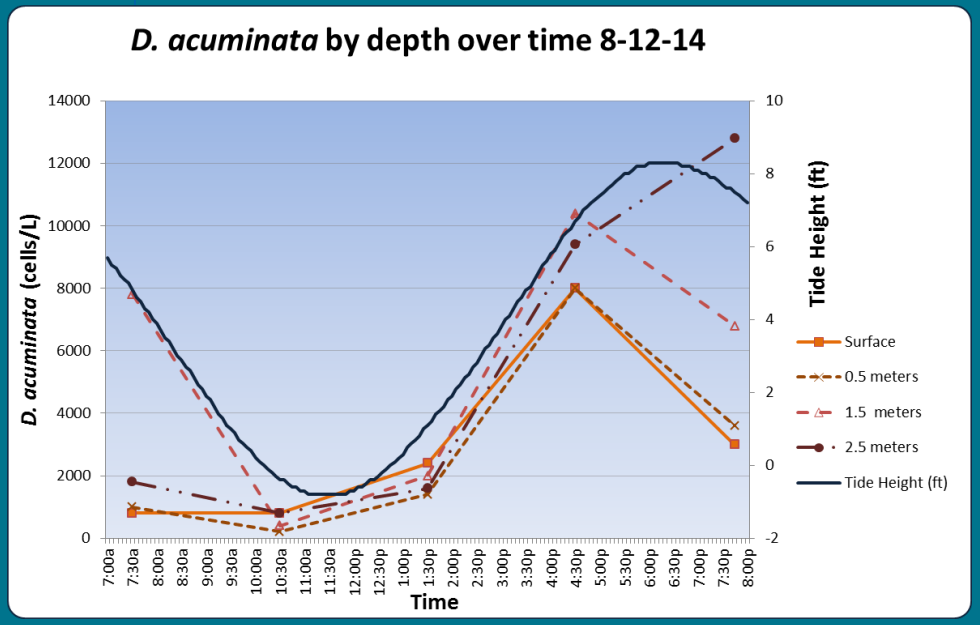
Toxin vs. type of shellfish



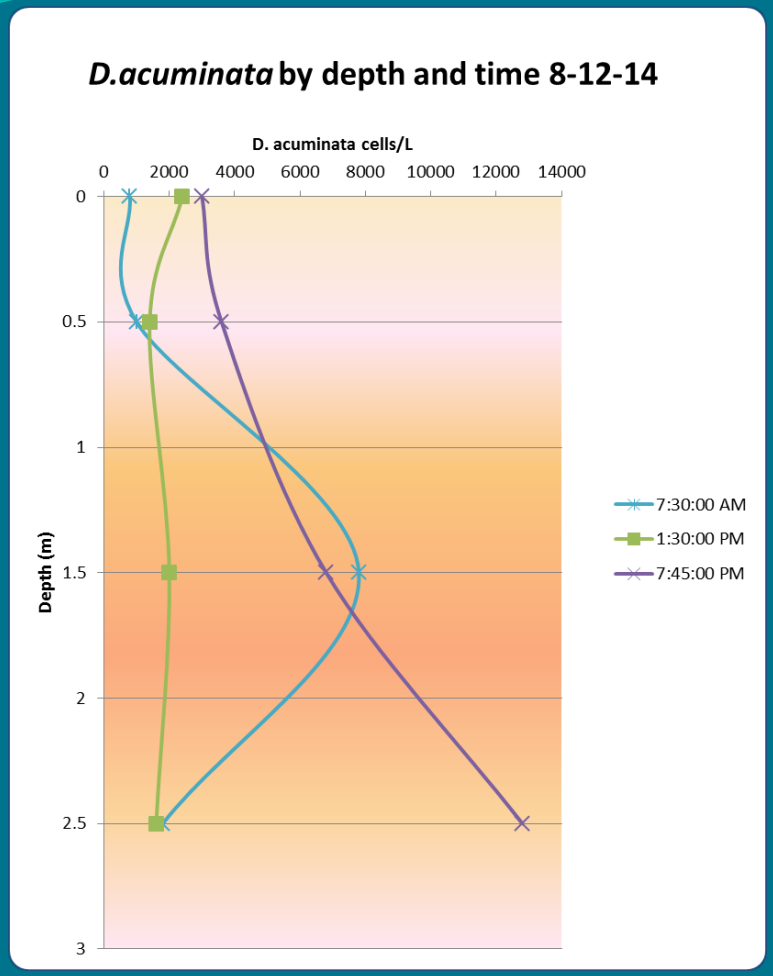
Geoduck< Littleneck clams< Manilas clams and Oysters < Mussels

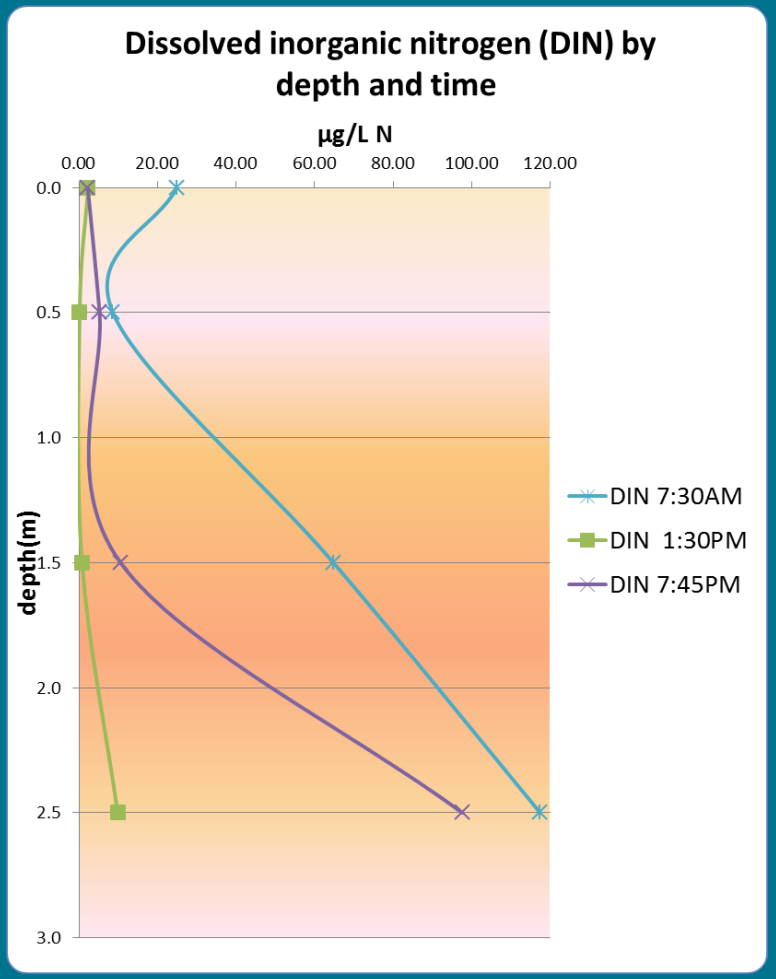
- Spatial and temporal variability of *Dinophysis*
- Sampled 4 depths 5 times over the course of a day
- Important to use depth integrated net tows to ID blooms






Aerial view of Sequim Bay
State Park
Blyn


D.acuminata by depth and time 8-12-14
D. acuminata cells/L
0
2000
4000
6000
8000
10000
12000
14000
Depth (m)
0
0.5
1
1.5
2
2.5
3
7:30:00 AM
1:30:00 PM
7:45:00 PM


Dissolved inorganic nitrogen (DIN) by depth and time
µg/L N
0.00
20.00
40.00
60.00
80.00
100.00
120.00
depth(m)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
DIN 7:30AM
DIN 1:30PM
DIN 7:45PM